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Historical Division
Frank B. Rogers

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ANNIVERSARY
ISSUE

MERRY
CHRISTMAS

A MESSAGE FROM THE CHIEF SURGEON TO MALARIOLOGISTS

AND ALL RANKS OF THE MALARIA SURVEY AND MALARIA CONTROL UNITS

1. The reduction of the malaria attack rate in this theater to a point at which it no longer constitutes a dangerous handicap to our military effort is an achievement in preventive medicine of historical importance. It has been the result of a joint effort which is to the great credit of all who have participated.

2. In this accomplishment the Malariologists and the Malaria Survey and Malaria Control Units have played the major role. Despite hardships and often danger their achievements have been notable.

3. The Medical Department is proud of your initiative and perseverance, of your professional contributions and of the striking success of your efforts.

4. As Chief Surgeon I express my deep appreciation of your past services and my confidence in your ability to meet the new tasks that lie ahead.

GUY B. DENIT
Brigadier General, United States Army
Chief Surgeon

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FLASH

ARMED
FORCES

SEP 10 1952

LIBRARY

New Units! Direct from the United States to Hollandia, the following three units have arrived in this theater:

120th Malaria Control -- Lt. Malik, Sn C, CO
207th Malaria Survey -- Captain F. J. Brinley, Sn C, CO
220th Malaria Survey -- Captain Fassig, Sn C, CO

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Lt. Wayne L. Howe of the 31st Malaria Survey Unit submits the following "Technical Report of Rat Ectoparasites on Morotai Island."

Since rats are extremely abundant at this base it was considered worthwhile to examine a sample of the population for ectoparasites. A series of 14 rats were collected all belonging to the Family Muridae. Three species were represented. Each has been stuffed to serve as study specimens.

A-Mites

1. Found on 5 rats.
2. Stages collected -- Larvae, nymphs and adults.
3. Identification:

One species belonging to the Family Parasitidae was found in abundance. Resembles the Tropical Rat Mite of the same family. Not a Typhus vector. Mature adult with a coriaceous shield.

4. Remarks:

Larvae attached to nose and ears. Nymphs and adults found in abundance, the thicker hair particularly in the region of the back and neck. No cases of human infestation observed.

B-Ticks

1. Found on 6 specimens.
2. Stages collected -- Larvae, nymphs, and adults (engorged and unengorged).
3. Identification:

Available keys are inadequate. In the only Ixodid key available it would be determined as Genus Rhipicephalus. The sites of the capitulum are sharply angulate but the mouth parts and pedipalps do not correspond to Rhipicephalus.

4. Remarks:

Two specimens, identical to those found on the rats have been removed from soldiers in this area. One was about $\frac{1}{2}$ engorged, the other little if any. Whether any tick-borne disease could be transmitted from the rat in this region is not known. The soldiers suffered no ill effects from the bites. Numerous specimens of all stages are preserved and mounted.

C-Lice

1. Found on rats.
2. Stages collected: Egg, nymphs and adults. (many engorged)
3. Identification:

A true sucking Louse (Order Anoplurs) No keys available for further identification.

4. Remarks:

Abundant when found. Nits attached to hairs. Adults 2mm to 2 $\frac{1}{2}$ mm long.

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The effect of indiscriminate clearance of a stream in New Guinea on incidence of Anopheles is shown by the results of a survey conducted by Capt William R. Horsfall of the 17th Malaria Survey Unit.

"The stream in the region where there was hardly any clearing had a larval incidence of five larvae/100 dips. Where the stream had been cleared the incidence was 69 larvae/100 dips. The small larval count in the first instance was obtained in one of the partially cleared sections of the stream. Along the cleared part of the stream larvae were present in nearly every little eddy behind a rock, a log or a stump.

"All larvae collected were Anopheles punctulatus moluccensis."

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"Disease Rates: The following rates have been computed from reports of dispensaries serving USASOS units attached or assigned to Base K. These figures are incomplete, as they do not show hospitalized cases. All hospitals were under jurisdiction of Sixth Army during the month, and no records of disease incidence are yet available."

Cases/1,000 men/annum based on dispensary and quarters cases only:

For week ending 10 November, 1944:

Malaria	Cases	0	Rate	0
Dengue	"	9	"	37.7
FUO	"	12	"	50.0

For week ending 17 November, 1944:

Malaria	Cases	2	Rate	6.0
Dengue	"	16	"	48.3
FUO	"	26	"	78.5

For week ending 24 November, 1944:

Malaria	Cases	2	Rate	4.5
Dengue	"	11	"	24.7
FUO	"	52	"	117.0

The above rates extracted from the monthly report of Captain D. Kirkham, Malariologist Base K.

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Yes, this issue is our Anniversary Edition. One year ago our newsletter was created for the purpose of disseminating pertinent information to all interested personnel in the most expeditious manner.

The exchange of ideas, the reviewing of malaria problems and their solutions, the results of extensive surveys in all theaters, and the presentation of new procedures in all the phases of malaria control have, we know, proved of some value to the workers in the field.

The constant hearty cooperation of many of the units and malariologists in contributing items and reports of interest has been instrumental in the success of our venture.

The editors wish to extend sincere thanks to all and ask for your continued support in the future. Remember, all contributions cheerfully received.

A report on 100 stools surveyed by a detachment from the 19th Medical General Laboratory revealed the following percentage of positives (71% for Hookworm, 69% for Roundworm, 64% for Whipworm, 34% for Schistosoma japonica, and 0% for E. histolytica).

Snails productive of fork-tailed cercariae and probably belonging to the genera, Melania and Oncomelania, have been found in rice paddies hereabouts. Captain Ferguson, D.S. 6th Army for Schistosoma study, suggests that in view of the preponderance of S. japonica ova deposited in the rice paddies, the cercariae above mentioned in all probability are those of S. japonicum.

The specimens were collected at random in the Dulag-Palo-Tacloban Sector of Leyte by 2nd Lt. Walter L. Barksdale.

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Lt. Emil Kotcher of the 39th Malaria Survey Unit offers some interesting sidelights on Animal Malaria which is worthy of consideration.

"Along with our regular malaria survey work we have been collecting various animals, in order to see if they harbor any parasites similar to the human plasmodia. We have done this because those doing research in the biology of plasmodia and malaria chemotherapeutics are always on the lookout for new species of parasite and host that might better serve for experimental purposes. Thus far we have found plasmodia in two birds, the yellow-crested cockatoo and the drongo. This Plasmodium resembles P. circumflexum in that the parasite partially encircles the nucleus of the erythrocyte. We have also found what appears to be a plasmodium in a grey-green monitor lizard.

"On the suggestion of Dr. Robert B. Watson who visited us in August, we began to hunt bats in an effort to find plasmodia in them. To date, as I remember, the only mammals in which plasmodia have been found are man, monkeys, gazelles, and antelopes. I know of no record in bats. Sgt James A. Bruce brought in a bat one day which he identified as either Syconycteris crassa papuana, or S. australis. It is a macroglossine bat with no evidence of an external tail. Blood smears on this bat revealed a parasite that very closely resembles the human plasmodia in the trophozoite and early schizont stages. Some crescent shaped forms have been seen that look like the gametocytes of P. falciparum. These may be distorted forms of an oval form the cytoplasm of which stains a deep blue with golden and dark brown pigment granules in it. The Plasmodium, for I believe it is a Plasmodium, does not cause the erythrocyte to enlarge.

"This chiropteran Plasmodium may upset some of the results obtained in the natural infection rates for wild-caught anopheline females in this theatre. While I am not sure that anopheline mosquitoes transmit this parasite, it is very likely, as only Anopheles mosquitoes have been found to transmit the mammalian plasmodia (except for one record of a Culex which has never been repeated). Anopheles p. moluccensis is the only anopheline mosquito on this island. We are hoping to catch some infected bats alive and see if oocysts and sporozoites will develop in moluccensis. We propose to do the same with some culicine mosquitoes.

"Blood smears of each of the above-mentioned hosts have been sent to the Army Medical Center in Washington for further study. Lt. Reginald D. Maxwell, who has done a great deal of research on avian and simian malaria, is stationed at the Medical Center, and it is hoped that these slides will come under his attention for study."

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NOTICE

Lt. Colonel W. V. King, Sn C, may be contacted for entomological consultations at the 19th Medical General Laboratory APO 565-2.

Also available upon request is a new key on culicines. Write him direct.

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Captain Victor W. Sauer of the 83rd Malaria Control Unit reports:

"A different type of breeding site was discovered in a former hospital area now vacated. The breeding took place in flower pots in which an inch or so of water stood over the soil. A hole punched in the side of the can eliminated standing water. The mosquito breeding were Aedes Scutellaris."

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THE ABSORPTION OF QUININE
AND ATABRINE IN PATIENTS WITH DIARRHOEA

by

1st Lt. Frederik B. Bang, M. C.
1st Lt John Maier, M. C., 2nd Lt Nelson G. Hairston, Sn. C.

It has been assumed that patients with diarrhoea fail to absorb oral quinine or atabrine, because of increased intestinal motility. Failure of atabrine suppression in soldiers with diarrhoea has been ascribed to this supposed poor absorption. It seemed probable that absorption of these drugs was not likely to be influenced by diarrhoea, since both are absorbed from the upper small intestine, and since atabrine actually stains the mucosa of the duodenum.

Accordingly, 33 cases of acute bacillary dysentery or non-specific diarrhoea were treated with atabrine, and 14 with quinine. Blood levels were measured to determine whether absorption took place. Only patients with moderately severe diarrhoea were included in the series. The number of stools on the day of admission varied from 2 to 30, and were distributed as follows:

<u>No. Stools</u>	<u>No. Cases</u>
2 - 5	16 (one with fever and pain,
6 - 10	23 one vomiting, one passing
11 - 30	8 undigested food)

Quinine hydrochloride, 40 grains in solution, was given in three doses for 3 days. Blood levels were measured on the second and third days, about three hours after the first dose of the day. Routine sulfaguanidine was given in all cases. The presence of sulfaguanidine in the blood was found not to interfere with the determination of quinine. The average levels are similar in patients with and without diarrhoea.

14 patients in the atabrine series were given 0.3 grams t.i.d. the first day and 0.2 grams t.i.d. the second day. Blood levels were measured on the second day, about three hours after the first dose of that day. These patients, who received routine sulfaguanidine in addition to atabrine, had an average blood level of 99 gamma per liter. 21 patients were given 0.3 grams atabrine t.i.d. the first day, and the blood levels were measured the next morning. These patients received no sulfaguanidine. The average blood level attained was 83. The difference between the two groups is not significant in view of the fact that no atabrine was given on the second day in the latter group. No patients were available who were taking sulfaguanidine but no atabrine. However, blood levels were measured on two patients taking suppressive atabrine (0.6 grams per week) who had completed one day of sulfaguanidine therapy. Blood levels on these cases were 17 and 19 gamma per liter, which are normal suppressive levels. This indicates that the presence of sulfaguanidine in the blood does not influence the atabrine determination. Therefore the high atabrine levels in patients with dysentery seem to represent a true increase.

SUMMARY

Quinine and atabrine are well absorbed by patients with diarrhoea or dysentery.

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ATTENTION MALARIA SURVEY UNITS

As indicated by the Chief Surgeon of the Southwest Pacific Area, collections of mosquitoes from the wide range of territory in which Army troops are now stationed are desired in order, (1) to accumulate information on the different kinds of mosquitoes present, their distribution and relative abundance, and their breeding and feeding habits; (2) to assist in developing methods for determining the relative abundance of the important species as a means of checking the effectiveness of the control work as well as to indicate areas of potential danger; (3) to provide identifications for all field units of the different species present; and (4) to take advantage of the opportunity to obtain specimen material of both the important species and the rarer or more unique forms for The Army Medical Museum and other institutions.

Collections will be made along the following general lines and the material forwarded to the 19th Medical Service Detachment (Gen. Lab.), APO 565, together with a copy of the tabulated collection records.

LARVAL COLLECTIONS

1. When a mosquito survey is made of a new area, all specimen material (or at least an adequate sample in the case of a very abundant species) should be preserved and sent in.

2. In controlled areas, a series of representative "stations" should be established for periodic examination, say every two weeks or at least once a month. The stations should consist of the following two general classes:

a. Ground waters, including all types of pools and ponds, wheel ruts, the edge of streams, swamps, etc. A representative section of a stream, a portion of a large swampy area, or an area with several or many wheel ruts, or natural pools, may each be set up as a station.

b. Water containers, including tin cans and barrels, coconut shells, tree holes and stump holes, leaf-axils of water-holding plants (such as taro plants) and fallen palm bracts or large leaves in damp woods. Selected areas such as a garbage dump or a coconut grove will constitute the stations, which are intended primarily to provide information on the dengue vectors and other pest mosquitoes. Special attention should be paid to sags in tent canvas and in canvas thrown over dumps.

ADULT MOSQUITO COLLECTIONS

Bed net inspections.--At least 30 bed nets in not less than ten quarters should be examined in each unit each month, or at least 10 per cent of the nets in units with more than 200 men. Nets that have been left down during the day should be examined by preference. If these are not available the nets that have been thrown over the top from one side may be dropped and examined. It is best to get inside the net with a flash light and killing tube. A record should be kept of the condition of the nets, listed as follows: good (no holes); fair (small holes only); poor (one or two holes an inch in diameter); very poor (with large holes and badly in need of repair or replacement).

OTHER MATERIAL

Specimens of other blood-sucking arthropods, such as ticks, mites, fleas, Phlebotomus, Culicoides etc. are also desired since some of these may prove to be of importance as disease vectors. Identifications will be furnished the sender so far as possible or the material will be forwarded to specialists.

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Mosq. Form 1

ADULT MOSQUITO COLLECTIONS

Date _____

| Place | | | Collectors | | | |
|-----------|----------|---------------------|------------------|-----|----------------|-----|
| Coll. No. | Location | Kind of Coll. place | Anophelines | | Culecines | |
| | | | Write in species | Tot | Write in spec. | Tot |
| | | | | | | |

Mosq. Form 2

LARVAL MOSQUITO COLLECTIONS

Date _____

| Place | | | Collectors | | | | |
|-----------|----------|------------------------|------------|----------|----------|------------------|------------------|
| Coll. No. | Location | Kind of breeding place | No. Dips | Tot. No. | Lv. & P. | Anophelines | Culecines |
| | | | | | | Write in species | Write in species |
| | | | | | | | |

Above are sample forms that may be used to record collection data.

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Captain M. S. Ferguson, SnC, of the 5th Malaria Survey Unit offers additional information on "Schistosomiasis Studies in Leyte, P.I."

A meeting of officers from ten Malaria Survey Units now in Leyte was held on November 22 and a tentative plan for work on the schistosomiasis problem agreed upon. The portion of the island occupied by our troops was divided into sections and the unit located in each will carry on stool and snail surveys to determine the incidence of S. japonicum. These surveys are now in progress and the findings of the various units will be coordinated from time to time.

Plans are being made for studies on clinical schistosomiasis, therapeutic regimes and killing agents for cercariae and the snail host.

Stool surveys in progress at Tacloban, Palo and Abuyog show that for these municipalities the highest infection rate exists in the vicinity of Palo.

Many collections of the snail host, Oncomelania hydrobropsis have been made in the municipality of Palo. These include collections from a stream and adjacent rice field in the Poblacion itself, a stream about one third mile south of Palo, and several streams, ponds, and rice paddies between Palo and the Barrio of San Antonio, which is located about three miles to the southwest. Infected snails have been found among these collections but the infection rate is low, being 1% or less. Large number of Oncomelanias have also been taken in Tarragona, Municipality of Abuyog. The infection rate was less than 1%.

Oncomelania hydrobropsis has now been taken from other habitats besides those mentioned in the last Newsletter. They occur on the under vegetation and logs in rather rapidly moving and clear water and on shaded mossy banks and cement bridges sometimes as much as two feet out of the water. They also may be found on moist soil under mats of dead grass two and three feet from water. In some rice fields these snails are plentiful on moist earth where there is little or no standing water or vegetation to afford shade. On cloudy days or during the early morning Oncomelania specimens are more often found out of the water, but this is not always the case, since they have been seen resting several inches above the water in bright sunlight.

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Authorative data received on the malaria situation in the Lingayen Area should indicate to some extent where we may expect our main problems.

1. The climate is tropical with definite wet and dry seasons. Temperatures range from about 60° to 100° with a mean annual temperature of 80°. Rainfall varies from about 70 inches to 130 inches, the greater portion falling in the warm months from May to November, resulting in high humidity during this period which has an enervating effect on the individual.

2. Malaria:

All three forms of malaria occur in the area. About 60% of cases show the benign tertian form, 39% the subtertian (malaria tropica of Dutch writers) and 1% the quartan type.

The prevalence of the disease varies from locality to locality, but in general the worst areas are in the foothills. Little malaria extends above 2000 feet, and the coastal plains, rice fields and swamps are not usually bad regions.

In Manila, conditions were good as regards malaria and cases met with there were infected elsewhere and not in the city. When considering the prevalence of malaria, however, it must be remembered that the figures quoted are for a normal pre-war period and position may have been aggravated by wartime conditions. Thus, at Bataan malaria reached serious proportions and with movement of troops and civilians it became rampant in Pampanga, Rizal and Manila. There is news that such spread has been checked.

The following anopheline mosquitoes were recorded in Central Luzon:-

| | |
|---|---|
| <u>A barbirostris</u> : | <u>A mangyanus</u> |
| <u>A filipinae</u> | <u>A minimus</u> , var <u>flavirostris</u> |
| <u>A fuliginosus</u> | <u>A philippinensis</u> |
| <u>A hyrcanus</u> , var <u>sinensis</u> | <u>A pseudobarbirostris</u> |
| <u>A insulaeflorum</u> | <u>A subpictus</u> , var <u>indefinitus</u> |
| <u>A ludlowi</u> (fresh water) | <u>A vagus</u> , var <u>limosus</u> |
| <u>A maculatus</u> | |

Four of these mosquitoes are considered to be the important vectors in the Philippines, viz A minimus var flavirostris, A mangyanus, A filipinae and A maculatus.

Dutch experience in the Netherlands East Indies also suggests that A hyrcanus var sinensis and A barbirostris may occasionally be of some importance as carriers.

The most dangerous vector, A minimus, var flavirostris, prefers slightly shady fresh, flowing, shallow water; ideal conditions for it are found in the foothill streams, especially where bamboo flourishes, but it also occurs in small pools at the edge of streams, in springs, irrigation channels and rice fields etc. This mosquito is most abundant in the transitional seasons, (ie) in May-June and October-November, and malaria tends to occur in two waves as a result.

Blackwater fever was an uncommon sequel to malaria in Central Luzon.

Malaria incidence by percentage Splenic Indices based on 1941 survey with additional information by Allied Geographical Section.

| | | |
|------------------|------------|------------|
| Tarlac 3 | Abucay 5 | Sisiman 71 |
| Ft. Stotenburg 2 | Balanga 10 | Cavite 55 |
| Dinalupihan 31 | Limay 23 | Rizal 59 |

The above information was extracted from The Allied Geographical Section Terrain Study #94 of Central Luzon.

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A compilation of Hookworm Surveys made to date shows the following information:

| UNIT | LOCATION | ADULT OR
CHILD | NUMBER
EXAMINED | NUMBER
POSITIVE | %
POSITIVE |
|---|--|-------------------|--------------------|--------------------|---------------|
| 30th Malaria Survey Unit
APO 159 | Baru and Nica
Compounds
Sansapor | all ages | 210 | 177 | 84.3 |
| 402nd Medical Composite
Unit (Malaria Survey)
APO 705 | Soldiers of
128 Inf, 32. Div
Aitape | men | 240 | 57 | 23.7 |
| 422nd Med Comp Unit
(Malaria Survey) | Emirau | native
men | 26 | | 74.3 |
| 30th Malaria Survey Unit
APO 159 | Sansapor | native
men | 117 | | 77.7 |
| 423 Medical Composite
Unit (Malaria Survey)
APO 716 | Bougainville
(Americal Div) | soldiers | 327 | 4 | 1.2 |
| 401st Medical Composite
Unit (Malaria Survey)
APO 37 | Bougainville
37th Division | soldiers | 464 | 34 | 7.3 |
| 41st Malaria Survey Unit
APO 928 | Baraga
Milne Bay | natives
adults | 124 | 59 | 47.5 |
| 401st Medical Composite
Unit (Malaria Survey)
APO 37 | Bougainville
37th Division | soldiers | 563 | 37 | 6.5 |
| 32nd Malaria Survey Unit
Nadzab | Native labor-
ers, Angau
native labor
camp, Nadzab | adult | 176 | 152 | 91.0 |
| 30th Malaria Survey Unit
Finschhafen | Cape Cretin | soldiers | 143 | | 5.6 |
| " | 14 NG miss-
ionaries,
Finschhafen
16 months under
Jap rule | adult | 14 | | 21.4 |
| " | Jap
prisoners | adult | 194 | 64 | 33.0 |
| " | soldiers | adult | 108 | | 6.5 |
| 40th Malaria Survey Unit
APO 322 | Jap
prisoners
Finsch | adult | 114 | 49 | 43 |
| 32nd Malaria Survey Unit | Nadzab | natives
adult | 110 | | 68 |
| " | Nadzab | soldiers | 81 | | 5 |

SECRET

HOOKMORI SURVEYS

SANSAPOR

Native 84.3%
" 86.4%
" 77.7%

ATTAPE

Soldiers 23.7%

FINSCHHAFFEN

soldier 5.6%
" 6.5%
NG missionaries 21.4%
Jap prisoners 33.0%
" 43.0%

ERITIAU

Native 74.3%

BOUGAINVILLE

soldier Americal
Division 1.2%
37 Division 7.3%
" 6.5%

MADZAB

native 91.0%
" 68.0

MILNE BAY

native 47.5%

soldier 5.0%

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